

We claim:

1. A method of making a porous body, comprising the steps of:

5 a) providing a dry flowable powder mixture comprising 10 – 90wt% of sinterable inorganic particles, 10 - 90wt% of binder, and 0.25 – 5wt% of foaming

agent;

b) shaping the flowable mixture

10 c) heating the resulting product to melt said binder while inducing foaming in the mixture;

d) heating the solidified mixture to decompose cleanly said binder; and

15 e) sintering the obtained product to form a solid low-density open-cell foam.

2. A method as claimed in claim 1, wherein a spacing agent is admixed with the powder formulation.

3. A method as claimed in claim 1, wherein the mixture is poured into a 15 porous scaffold spacing agent.

4. A method where the spacing agent of claims 2 and 3 is removed by thermal decomposition or leaching after foaming.

5. A method as claimed in claim 1, wherein foaming is done on or in another structure, the structure being a solid component or a porous body.

20 6. A method where the structure is not decomposed during foaming, debinding and sintering to provide composite component or material.

7. A method as claimed in claim 1, wherein said sinterable particles are metal particles in a wt% of 40 – 90%.

8. A method as claimed in claim 1, wherein said sinterable particles are 25 ceramic particles in a wt% of 10 – 60%.

9. A method as claimed in claim 1, wherein said sinterable particles are coated particles

10. A method as claimed in claim 1, wherein said sinterable particles are a mixture of metallic, ceramic and/or coated particles.
11. A method as claimed in claim 1, wherein said binder content is between 20 to 70 wt%.
- 5 12. A method as claimed in claim 1, wherein the content of solid foaming agent is between 0.5 and 3 wt%.
13. A method as claimed in claim 1, wherein said dry flowable powder mixture further comprises 0.05wt% to 5 wt% of additional binder to minimize segregation and dusting and improve the flowability of the mixture.
- 10 14. A method as claimed in claim 1, wherein said flowable mixture is subject to successively increasing temperatures to carry out at least steps b, c, d and e.
15. A method as claimed in claim 1, wherein said temperatures are increased in a stepwise manner.
16. A method as claimed in claim 1, wherein said powder is heated at a temperature between 40°C to 250°C to melt said binder.
17. A method as claimed in claim 1, wherein said powder is heated at a temperature between 75°C to 200°C to melt said binder.
- 20 18. A method as claimed in claim 9, wherein step e is carried out at a temperature ranging from 30% to 90 % of the melting temperature of said sinterable material.
19. A method as claimed in claim 11, wherein step e is carried out at a temperature ranging from 45 to 75% of the melting temperature of said sinterable material.
- 20 25. A method as claimed in claim 1, wherein said binder is solidified with the aid of a curing agent.
21. A method as claimed in claim 1, wherein said binder is a thermoset resin.
22. A method as claimed in claim 1, wherein said binder is a thermoplastic

polymer.

23. A method as claimed in claim 17, wherein said thermoplastic polymer is cured with the aid of a curing agent or by a cross-linking treatment selected from the group consisting of irradiation and light exposure.

5 24. A method as claimed in claim 1, wherein said shaping step is carried out by a process selected from the group consisting of molding, deposition and lamination.

25. A method as claimed in claim 1, wherein the foaming agent is a solid.

26. A method as claimed in claim 20, wherein the foaming agent is a liquid

10 embedded or in solution in the binder.

27. A method as claimed in claim 21, wherein the foaming agent is a gas in solution in the binder;

28. A method as claimed in claim 22, wherein the foaming agent is a mixture on two or more foaming agents selected from the group consisting of solid

15 foaming agents, liquid foaming agents embedded or in solution in the binder, and gaseous foaming agents embedded or in solution in the binder.

29. A method as claimed in claim 1, wherein pressure is applied to the powder mixture before or during the heating thereof.

30. A method as claimed in claim 1, wherein the organic binder is blended

20 with the other components of said mixture by dry mixing, milling.

31. A method as claimed in claim 1, wherein the organic binder is blended with the other components of said mixture by mixing the binder in suspension or solution in liquid.

32. A method as claimed in claim 31, wherein said liquid is removed by the

25 application of heat.

33. A method as claimed in claim 1, wherein the resulting material is machined, assembled or coated.

34. A method of making a porous body, comprising the steps of:  
a) providing a dry flowable powder mixture comprising 10 – 90wt% of sinterable particles, 10 - 90wt% of binder, and 0.25 – 5wt% of solid foaming agent;

5 b) shaping the flowable mixture into a predetermined form;  
c) heating said product to melt said binder so that it flows around said sinterable particles to close pores in the mixture;  
d) inducing foaming in the mixture;  
e) heating the solidified product to burn out said binder; and  
10 f) sintering the resulting product to form a solid low-density open-cell foam.

35. A method as claimed in claim 34, wherein the powder mixture is subjected to stepwise increasing temperatures to carry out steps b, d, and e.

36. A precursor composition for making sintered porous bodies in the form of a dry flowable powder mixture comprising 10 – 90wt% of sinterable particles, 10 – 90wt% of binder, and 0.25 – 5wt% of foaming agent.

37. A precursor composition as claimed in claim 36, further comprising 0.05wt% to 5wt% of additional binder to minimize segregation and dusting and improve the flowability of the mixture.

20 38. A precursor composition as claimed in claim 36, wherein said sinterable particles are metal particles in a wt% of 40 – 90%.

39. A precursor composition as claimed in claim 36, wherein said sinterable particles are ceramic particles in a wt% of 10 – 60%.

40. A precursor composition as claimed in claim 36, wherein said sinterable 25 particles are coated particles in a wt% of 10 – 90%.

41. A precursor composition as claimed in claim 36, wherein said sinterable particles are a mixture of metal, ceramic and/or coated particles in a wt% of 10 – 60%.

42. A precursor composition as claimed in claim 36, wherein said binder content is between 20 to 70 wt%.

43. A precursor composition as claimed in claim 36, wherein the content of foaming agent is between 0.5 and 5 wt%.

5 43. A precursor composition as claimed in claim 36, further comprising a lubricant to ease shaping, molding or demolding.

45. A precursor composition as claimed in claim 36, wherein the foaming agent is incorporated in the mixture in a state selected from the group consisting of the solid, liquid or gaseous state.

10 46. A precursor composition as claimed in claim 36, wherein the mixture comprises flowing agents to improve the flowability of the mixture.